



**Sughrue**

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518 Rec'd PCT/PTO 13 SEP 2001

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September 13, 2001

## BOX PCT

Commissioner for Patents  
Washington, D.C. 20231

PCT/JP00/00362  
-filed January 25, 2000

Re: Application of Toru IWAKAWA  
A REINFORCING HOLDER AGAINST VIBRATIONS  
Assignee: NIPPON EISEI CENTER CO., LTD.  
Our Ref: Q65399

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter II of the Patent Cooperation Treaty: an English translation of the International Application, 5 sheets of drawings, an executed Declaration and Power of Attorney, an executed Assignment and 1595 form, and a Preliminary Amendment.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

### **Applicant claims benefit of small entity status in accordance with 37 CFR § 1.27.**

The Government filing fee is calculated as follows (**Small Entity fees apply**):

Total claims	<u>12</u>	-	20	=	<u>          </u>	x	\$9.00	=	<u>      </u>	\$0.00
Independent claims	<u>1</u>	-	3	=	<u>          </u>	x	\$40.00	=	<u>      </u>	\$0.00
Base Fee										\$430.00

### **TOTAL FILING FEE**

\$430.00

### **Recordation of Assignment**

\$ 40.00

### **TOTAL FEE**

\$470.00

Checks for the statutory filing fee of \$430.00 and Assignment recordation fee of \$40.00 are attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

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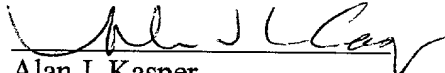
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Honorable Commissioner of Patents  
September 13, 2001  
Page 2

There is no claim to priority.

Respectfully submitted,

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Registration No. 25,426

Date: September 13, 2001

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## DESCRIPTION

A REINFORCING HOLDER AGAINST VIBRATIONS

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## Technical Field

10 The present invention relates to a reinforcing holder against vibrations mounted on the joining part of structural members such as foundations, columns, beams and cross-beams or the like to reinforce them so that a wooden building may not be broken down even if strong vibrations are loaded by an earthquake, a typhoon or the like.

## Background Art

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So far, as methods of reinforcing the joining part of structural members of a wooden building, there have been various methods employed: providing bracings or horizontal braces, or mounting clamps or L-shaped metal fittings.

20 However, in such conventional methods as described above, no sufficient reinforcing effect can be obtained in a case where strong vibrations are loaded by an earthquake, a typhoon or the like, and the structural members tend to be easily disjoined or sustain damage in the joining parts so that wooden buildings sometime may break in  
25 the joining parts, or in a severe case, the buildings may fall down.

In view of the foregoing, the reinforcing holder against vibrations 41 shown in the perspective view of FIG. 5 has been devised and used to sufficiently withstand even strong vibrations caused by an earthquake, a typhoon or the like.

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Toru IWAKAWA

Appln. No.: UNKNOWN

Confirmation No.: UNKNOWN

Group Art Unit: UNKNOWN

Filed: September 13, 2001

Examiner: UNKNOWN

For: A REINFORCING HOLDING AGAINST VIABRATIONS

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

**IN THE CLAIMS:**

**Please enter the following amended claims:**

4. (Amended) The reinforcing holder against vibrations according to claim 1, wherein a cushion round is formed in the approximate center part of the intermediate part of the reinforcing base member.

5. (Amended) The reinforcing holder against vibrations according to claim 1, wherein the said plate is formed of high tension steel.

**Please add the following new claims:**

6. (New) The reinforcing holder against vibrations according to claim 2, wherein a cushion round is formed in the approximate center part of the intermediate part of the reinforcing base member.

7. (New) The reinforcing holder against vibrations according to claim 3, wherein a cushion round is formed in the approximate center part of the intermediate part of the reinforcing base member.

8. (New) The reinforcing holder against vibrations according to claim 2, wherein the said plate is formed of high tension steel.

9. (New) The reinforcing holder against vibrations according to claim 3, wherein the said plate is formed of high tension steel.

10. (New) The reinforcing holder against vibrations according to claim 4, wherein the said plate is formed of high tension steel.

11. (New) The reinforcing holder against vibrations according to claim 6, wherein the said plate is formed of high tension steel.

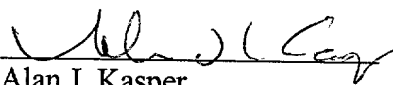
12. (New) The reinforcing holder against vibrations according to claim 7, wherein the said plate is formed of high tension steel.

**REMARKS**

Entry and consideration of this Amendment is respectfully requested.

Respectfully submitted,

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Alan J. Kasper  
Registration No. 25,426

Date: September 13, 2001

**APPENDIX**  
**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

**The claims are amended as follows:**

4. (Amended) The reinforcing holder against vibrations according to ~~claims 1, 2 or 3,~~  
claim 1, wherein a cushion round is formed in the approximate center part of the intermediate  
part of the reinforcing base member.

5. (Amended) The reinforcing holder against vibrations according to ~~claims 1, 2, 3 or 4,~~  
claim 1, wherein the said plate is formed of high tension steel.

**Claims 6-12 are added as new claims.**

The reinforcing holder against vibrations 41 comprises an L-shaped base member 42 formed by bending a plate formed of high tension steel in the form of an L-shape and formed with bent and swelled parts 43a and 43b bent inward in intermediate parts of both piece parts 42a and 42b, a reinforcing member 44 formed by bending a plate formed of high tension steel and fixedly mounted by welding on a bent corner part 42c of the L-shaped base member 42, and absorbing members 45 formed of shock-absorbing rubber or the like stopped at several locations of the L-shaped base member 42.

According to the above-mentioned arrangement, both vertical and horizontal strong vibrations can be absorbed by the whole L-shaped base member 42 and its bent and swelled parts 43a and 43b, and deformation of the L-shaped base member 42 can be removed and the original shape thereof can be restored. Therefore, even if strong vibrations are loaded, a wooden building may not easily break in the joining parts or may not easily fall down.

However, since the above-mentioned reinforcing holder against vibrations 41 is provided with the L-shaped base member 42, there is a limitation that the reinforcing holder needs to be mounted, for its structural reasons, with the both piece parts of the L-shaped base member 42 being attached astride on the same inner surface sides of the structural members crossed at right angles. Therefore, for instance, in a case where another structural member exists between the structural members to be joined, another structural member comes to be an obstacle and there is the inconvenience of incapacitating the reinforcing holder against vibrations 41 for being mounted.

Further, since the reinforcing member 44 is fixedly mounted by welding on the L-shaped base member 42, and the bent corner part



42c of the L-shaped base member 42 and the bent corner part 44c of the reinforcing member 44 are placed in close contact, the amount of elastic deformation is small, and the effect of removing the deformation of the L-shaped base member 42 and restoring the original shape thereof is also insufficient.

#### Disclosure of Invention

The present invention is accomplished to solve such problems as noted above with respect to prior art. It is an object of the present invention to provide a reinforcing holder against vibrations with enhanced absorption of vertical and horizontal vibrations and vertical oscillations and enhanced vibration-proof performance so that a wooden building may not fall down even if strong vibrations caused by an earthquake, a typhoon or the like are loaded thereupon.

The present invention is intended to solve the problems and achieve the aforementioned object by providing the reinforcing holder against vibrations comprising a reinforcing base member formed by twisting and bending both end parts of a plate in one direction to form fixing piece parts and absorbing members with rubber elasticity, characterized in that the reinforcing base member is fixed to structural members via the absorbing members.

In the reinforcing holder against vibrations, a bent and swelled part is formed by bending twice outward the intermediate part of the reinforcing base member or a curved and swelled part is formed by curving outward the intermediate part and, preferably, a cushion round is formed in an approximate center part of the bent and swelled part or the curved and swelled part.

It is more preferable that the plate is formed of high tension

steel, since it is excellent in tensile strength, weldability, notch toughness, workability and corrosion resistance.

#### Brief Description of Drawings

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FIG. 1 is a perspective view of an embodiment of the present invention. FIG. 2 is a perspective view of an embodiment of the present invention mounted on the structural members. FIG. 3 is a sectional view of the embodiment cut along arrows X-X shown in FIG. 2. FIG. 4 is a perspective view of another embodiment of the present invention. FIG. 5 is a partially perspective view of a twisted and bent corner of a fixing piece formed in the reinforcing base member of the present invention. FIG. 6 is a perspective view of a conventional reinforcing holder against vibrations.

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#### Best Mode for Carrying out the Invention

Preferred embodiments of the reinforcing holder against vibrations according to the present invention will be described concretely hereinafter based upon the drawings.

20

FIG. 1 is a perspective view of an embodiment of the present invention, FIG. 2 is a perspective view of an embodiment of the present invention mounted on the structural members, FIG. 3 is a sectional view of the embodiment cut along arrows X-X shown in FIG. 2, FIG. 4 is a perspective view of another embodiment of the present invention and FIG. 5 is a partially perspective view of a twisted and bent corner of a fixing piece formed in the reinforcing base member of the present invention.

25

As shown in perspective views of FIGs. 1, 2 and 4, the

reinforcing holder against vibrations according to the present invention comprises a reinforcing base member 1 formed by twisting and bending both end parts of a plate in one direction to form fixing pieces 11, 11 and absorbing members 2 with rubber elasticity, and is characterized in that the reinforcing base member 1 is fixed to structural members A via the absorbing members 2. The reinforcing holder against vibrations is also characterized in that the reinforcing base member 1 is bent twice outward in the intermediate part 12 to form a bent and swelled part 13 having a plane face or is curved outward in the intermediate part 12 to form a curved and swelled part 14. Preferably, a cushion round 15 is formed in the approximate center part of the intermediate part 12 of the reinforcing base member 1.

According to the present invention, the absorbing members 2 are securely fixed on the reinforcing base member 1, and the bent and swelled part 13 or the curved and swelled part 14 is formed outside of the intermediate part 13 of the reinforcing base member 1, wherefore vertical and horizontal vibrations and vertical oscillations can be absorbed, and the restoring performance can be enhanced so that the resistance to inclinations and torsions can be enhanced even if strong vibrations caused by an earthquake, a typhoon or the like are loaded upon the wooden building. Further, if the cushion round 15 is formed in the approximate center part of the intermediate part 12 of the bent and swelled part 13 or the curved and swelled part 14, vibration-proof performance can be much more enhanced owing to the absorbing effect thereof.

Further, as shown in FIG. 2, even if another structural member B exists between the structural members A to be jointed, the reinforcing holder against vibrations can be mounted on the

structural members avoiding the said another structural member B, wherefore the reinforcing holder against vibrations is so convenient as to be mountable on such parts that a conventional reinforcing holder against vibrations cannot be mounted on.

5       The reinforcing holder against vibrations of the present invention comprises a reinforcing base member 1 and absorbing members 2.       The reinforcing base member 1 is formed preferably of a plate with a thickness of 5 mm formed of iron and steel material with both flexibility and strength, and both end parts thereof are  
10       twisted and bent in one direction to form fixing pieces 11 and 11 having edge pieces 17 and 17, as shown in FIGs. 1 and 4.

Preferably, construction steel is employed for iron and steel material, and particularly preferably, high tension steel is employed. High tension steel is obtained by adding to low carbon steel a small  
15       quantity of a suitable combination of alloy elements such as manganese, silicon, nickel, chrome, molybdenum and generally has tensile strength of not less than 50 kg/mm<sup>2</sup> and yield point of not less than 30 kg/mm<sup>2</sup> and is excellent in tensile strength, weldability, notch toughness, workability and corrosion resistance.

20       With regard to the twisted and bent corners of the fixing pieces 11 and 11 formed on both end parts of the plate, as shown in the partially perspective view of FIG. 5, since the reinforcing base member 1 needs to be fixed along side surfaces of structural members A showing the cross-sectional shape of a square column and the angle  
25        $\theta$  -1 viewed from the direction of the arrow x should be set at 90° , whereas the angle  $\theta$  -2 viewed from the direction of the arrow y in bent corner parts of the fixing pieces 11 and 11 should be set properly according to the angle at which the reinforcing holder against vibrations is mounted on the structural member A.

The fixing pieces 11 and 11 are provided with fixing holes 16 through which fixing members 3 such as screws, nails or the like are fixed to the structural members A such as foundations, columns, beams and cross-beams via the absorbing members 2.

5 In the reinforcing base member 1, the bent and swelled part 13 having plane face 131 is formed by bending twice outward the intermediate part 12 as shown in FIG. 1, or the curved and swelled part 14 having curved face 141 is formed by curving outward the intermediate part 12 as shown in FIG. 4.

10 Preferably, the approximate center part of the bent and swelled part 13 or the curved and swelled part 14 can be swelled inward or outward in the shape of an  $\Omega$  to form the cushion round 15 to enhance the absorbing effect.

15 The absorbing members 2 mounted on the contact parts 11 and 11 of the reinforcing base member 1 are formed of shock-absorbing rubber having rubber elasticity with excellent elastic characteristics and durability. As shown in FIG. 3, a contact surface 22 contacting the structural member A is provided on the back side of the absorbing member, and holding parts 23 holding the fixing piece 11 of the  
20 reinforcing base member 1 are provided on the front side thereof, and an adjusting hole 21 is bored in the central part of the absorbing member, enabling fine adjustment of the position of the reinforcing base member 1 mounted.

25 The process of mounting the reinforcing holders against vibrations of the present invention will be described hereunder.

As shown in FIG. 2, in the fixing pieces 11 and 11 of the two reinforcing base members 1 and 1, the absorbing members 2 are attached to a part of the fixing piece 11 to be fixed to the beam member A-1 of the structural member A and to a part of the fixing

piece 11 to be fixed to the column member A-2 of the structural member A in advance. After the lower fixing piece 11 of one reinforcing base member 1 is fixed to the beam member A-1 with the use of the fixing member 3 via the absorbing member 2, the upper  
5 fixing piece 11 thereof is touched to a first face a1 and a second face a2 of the column member A-2 and is fixed thereto with the use of the fixing member 3 via the absorbing member 2.

Subsequently, after the lower fixing piece 11 of the other reinforcing base member 1 is fixed to the beam member A-1 with the  
10 use of the fixing member 3 via the absorbing member 2, the upper fixing piece 11 thereof is touched to a third face a3 and a fourth face a4 of the column member A-2 and is fixed thereto with the use of the fixing member 3 via the absorbing member 2 attached to the edge  
15 piece 17 of the fixing piece 11. In this manner, the beam member A-1 and the column member A-2 of the structural member A can be firmly jointed.

Both of the reinforcing base members 1 can join the beam member A-1 and the column member A-2 firmly avoiding another structural member B.

20 In the above-mentioned embodiment, the reinforcing holder against vibrations of the present invention is described as to the case where the beam member A-1 is joined with the column member A-2 of the structural members A. However, the usage of the reinforcing holder against vibrations is not limited to the case and the  
25 reinforcing holder against vibrations can also be used effectively to join a column member with a cross-beam member and to join a beam member with a cross-beam member or the like.

So far, for instance, as shown in FIG. 2, in the case where another structural member B exists between the beam member A-1

and the column member A-2 of the structural members A, there has been the inconvenience of incapacitating reinforcing holders against vibrations for being mounted. According to the present invention, the inconvenience mentioned above can be avoided. Further, by  
5 providing the bent and swelled part 13, the curved and swelled part 14, or the cushion round 15 formed in the reinforcing base member 1 and the absorbing members 2 with rubber elasticity existing between the structural members A and the reinforcing base member 1, vertical and horizontal vibrations and vertical oscillations applied to  
10 the structural members A can be absorbed and the restoring performance can be enhanced. Therefore, resistance to inclinations and torsions can be enhanced accordingly even if strong vibrations caused by an earthquake, a typhoon and the like are loaded upon a wooden building, and the action and effect that the vibration-proof  
15 performance can be much more enhanced is obtained.

The present invention comprising the above-mentioned construction has the following effects.

According to the present invention, vertical and horizontal vibrations and vertical oscillations can be absorbed and restoring  
20 performance can be enhanced, wherefore resistance to inclinations and torsions can be enhanced accordingly even if strong vibrations caused by an earthquake or the like are loaded upon a wooden building, and the action and effect that the vibration-proof performance can be much more enhanced is obtained. Further, even  
25 if another structural member is disposed between the structural members to be jointed, the reinforcing holders against vibrations of the present invention is so remarkably convenient and useful as to be mounted avoiding another structural member.

## CLAIMS

1. A reinforcing holder against vibrations comprising:

5 a reinforcing base member formed by twisting and bending both end parts of a plate in one direction to form fixing pieces, and absorbing members having rubber elasticity, the said reinforcing base member being fixed to structural members via the said absorbing members.

10 2. The reinforcing holder against vibrations according to claim 1, wherein a bent and swelled part having plane face is formed by bending twice outward the intermediate part of the reinforcing base member.

15 3. The reinforcing holder against vibrations according to claim 1, wherein a curved and swelled parts having curved face is formed by curving outward the intermediate part of the reinforcing base member.

20 4. The reinforcing holder against vibrations according to claims 1, 2 or 3, wherein a cushion round is formed in the approximate center part of the intermediate part of the reinforcing base member.

5. The reinforcing holder against vibrations according to claims 1, 2, 3 or 4, wherein the said plate is formed of high tension steel.



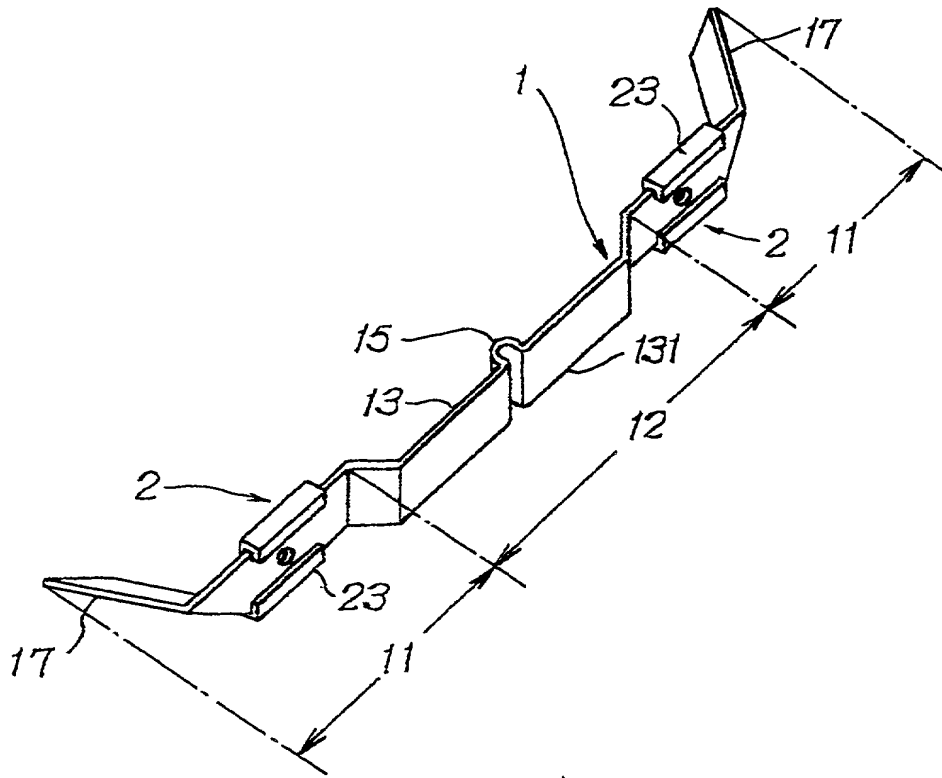


FIG. 1

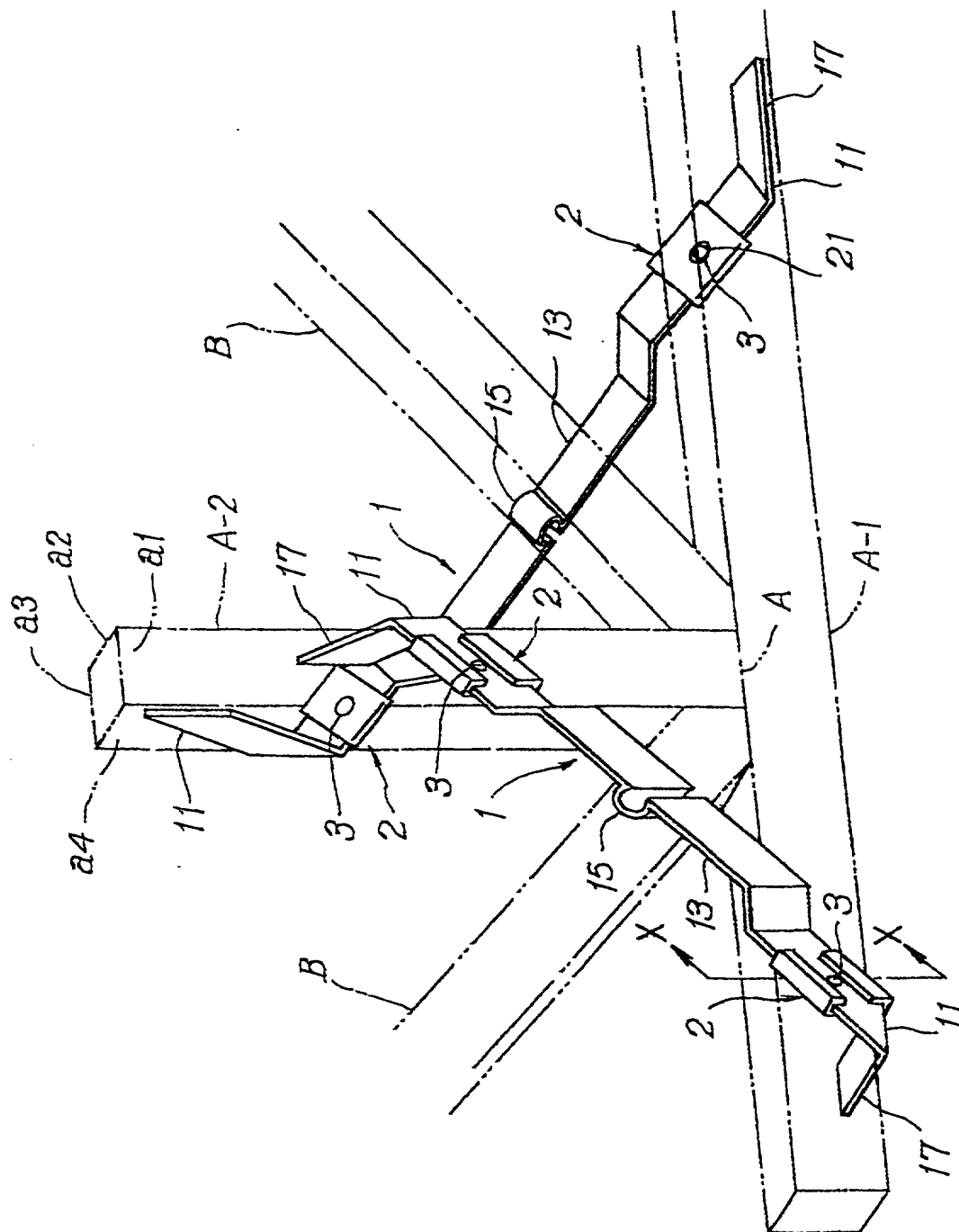


FIG. 2

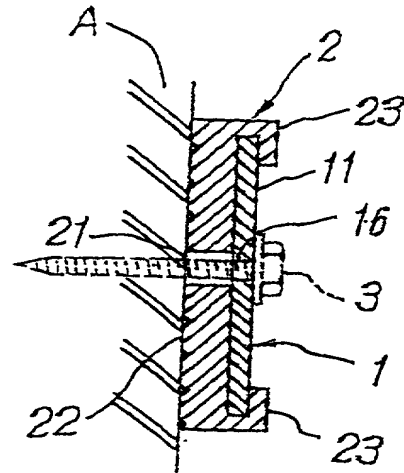
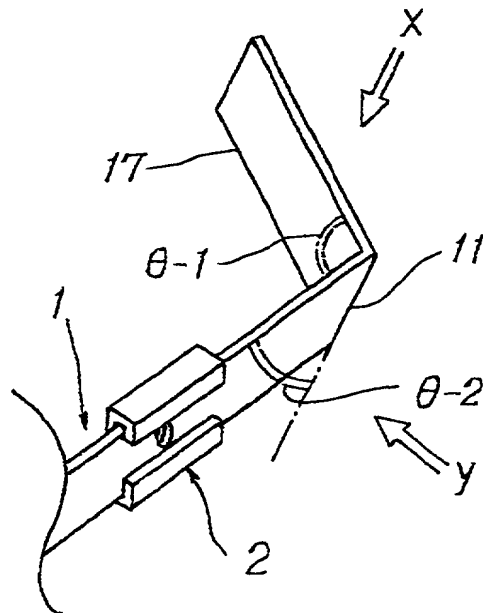
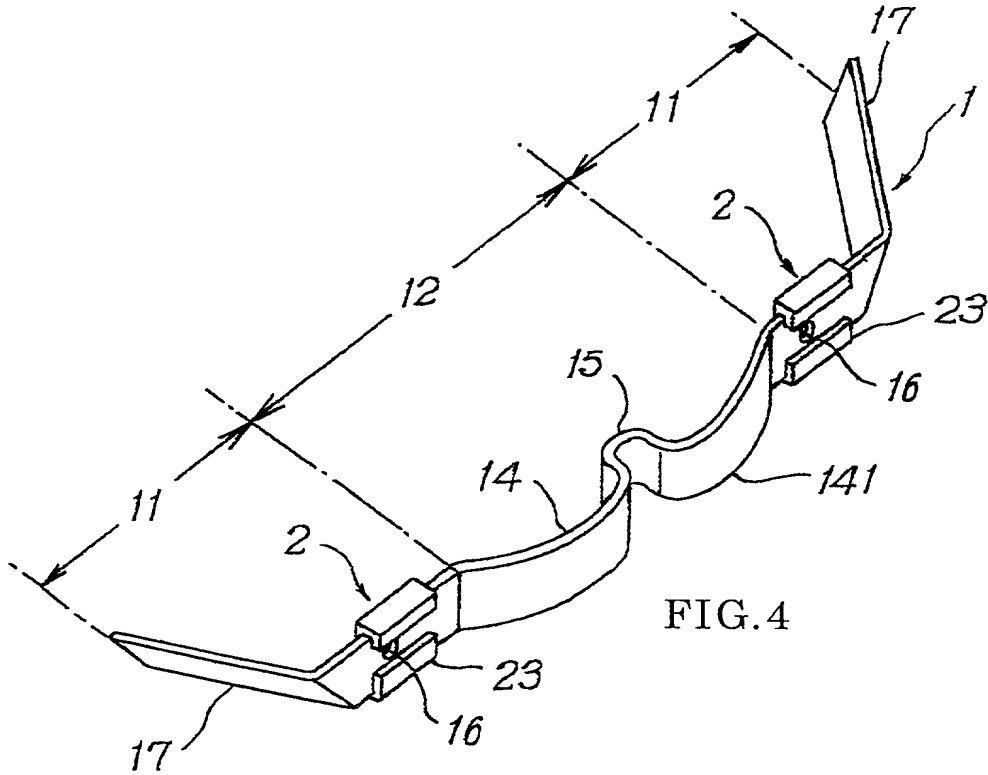


FIG. 3



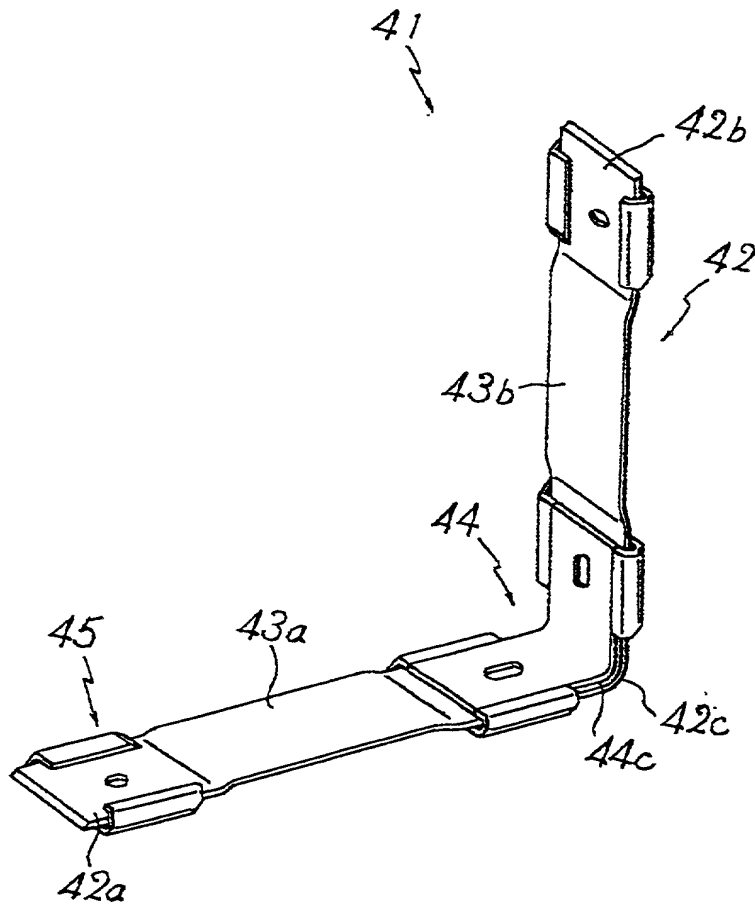


FIG. 6

# DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name: that I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought in the application entitled: A REINFORCING HOLDER AGAINST VIBRATIONS

which application is:

☐ the attached application  
(for original application)

☒ application Serial No. PCT/JP00/00361  
filed 25 JANUARY 2000, and amended on \_\_\_\_\_

(for declaration not accompanying application)

that I have reviewed and understand the contents of the specification of the above-identified application, including the claims, as amended by any amendment referred to above; that I acknowledge my duty to disclose information of which I am aware which is material to the patentability of this application under 37 C.F.R. 1.56, that I hereby claim priority benefits under Title 35, United States Code §119, §172 or §365 of any provisional application or foreign application(s) for patent or inventor's certificate listed below and have also identified on said list any foreign application for patent or inventor's certificate on this invention having a filing date before that of any foreign application on which priority is claimed:

Application Number	Country	Filing Date	Priority Claimed (yes or no)
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I hereby claim the benefit of Title 35, United States Code §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in a listed prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge my duty to disclose any information material to the patentability of this application under 37 C.F.R. 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)
------------------------	-------------	------------------------------------------

I hereby appoint John H. Mion, Reg. No. 18,879; Thomas J. Macpeak, Reg. No. 19,292; Robert J. Seas, Jr., Reg. No. 21,092; Darryl Mexic, Reg. No. 23,063; Robert V. Sloan, Reg. No. 22,775; Peter D. Olexy, Reg. No. 24,513; J. Frank Osha, Reg. No. 24,625; Waddell A. Biggart, Reg. No. 24,861; Louis Gubinsky, Reg. No. 24,835; Neil B. Siegel, Reg. No. 25,200; David J. Cushing, Reg. No. 28,703; John R. Inge, Reg. No. 26,916; Joseph J. Ruch, Jr., Reg. No. 26,577; Sheldon I. Landsman, Reg. No. 25,430; Richard C. Turner, Reg. No. 29,710; Howard L. Bernstein, Reg. No. 25,665; Alan J. Kasper, Reg. No. 25,426; Kenneth J. Burchfiel, Reg. No. 31,333; Gordon Kit, Reg. No. 30,764; Susan J. Mack, Reg. No. 30,951; Frank L. Bernstein, Reg. No. 31,484; Mark Boland, Reg. No. 32,197; William H. Mandir, Reg. No. 32,156; Brian W. Hannon, Reg. No. 32,778; Abraham J. Rosner, Reg. No. 33,276; Bruce E. Kramer, Reg. No. 33,725; Paul F. Neils, Reg. No. 33,102; Brett S. Sylvester, Reg. No. 32,765; Robert M. Masters, Reg. No. 35,603 and George F. Lehnigk, Reg. No. 36,359 my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and request that all correspondence about the application be addressed to SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC, 2100 Pennsylvania Avenue, N.W., Washington, D.C. 20037-3202.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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